WSR-88D Program Software Changes
That May Impact
Radar Product Central Collection Dissemination Service (RPCCDS) Users

Updated 14 June 2006

PURPOSE:
This summary is intended to assist RPCCDS users plan for WSR-88D changes which may impact data format, availability, frequency, or quality. While many changes are made to the WSR-88D software during software releases to field sites, only a small subset may affect RPCCDS users.

CURRENT:
Open Radar Data Acquisition (Open RDA): Five Open RDA systems are installed each week. The installation requires up to 5 days of radar down time. Information on the Open RDA and the deployment schedule can be found at: http://www.orda.roc.noaa.gov/. The format of the products based on Open RDA-generated data does not change with respect to the legacy RDA. Changes RPCCDS users are likely to see are: the Open RDA clock will be synchronized with a Global Positioning Satellite clock; radials are at fixed azimuths and there are always 360 radials per cut; and the Clutter Filter Control product (CFC, Product 34) is changed somewhat to remove suppression levels and channels. Additional information can be found at in the “”Update” section at: http://www.osf.noaa.gov/NWS_Level_2/.

Build 8: Network-wide deployment of Radar Product Generator (RPG) Build 8 software began on 1 May 2006 and is now complete. Over 90 sites have installed the software. Non-redundant RDA sites will install Build 8 software on their RPG after the Open RDA has been installed on their WSR-88D (60-day window). At redundant RDA sites (all FAA and 9 NWS sites), the Build 8 software will be loaded on the RPG(s) when the Open RDAs are installed. Over 100 sites have loaded Build 8 on their Open RDA. Open RDA software Build 8.0.1 will be released to field sites beginning the week of 10 July 2006. Build 8.0.1 will correct some internal software errors. There will be no change in products.

The performance of some of the products will change in Build 8 as described below.

> The Storm Cell Identification and Tracking (SCIT) algorithm used to generate Product 58, Storm Tracking Information (STI), is enhanced in Build 8. The format of the product will not change, however, the content of the text portion (TAB) of the STI and Product 62, Storm Structure (SS), products will contain three SCIT filter configuration data values for information purposes. A brief summary of the algorithm changes follows:
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> > The input reflectivity data will be median filtered (smoothed) using a kernel which adjusts for different ranges. These filtered data are used to identify storm cells and their locations. Unfiltered data are used to determine all other storm attributes, such as maximum reflectivity. Tests by National Severe Storm Laboratory scientists indicate the filtering results in fewer storms being identified and storms are less likely to be fragmented (i.e., one storm being identified as multiple storms). This results in improved storm cell identification and in a lower tracking error rate.
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> Some fields in the alphanumeric component of certain Level III precipitation products will be

removed. These fields were associated with logic in the precipitation processing software referred to as the "Time Continuity Test." Affected products include: OHP, STP, DPA, DSP, DHR, and SPD. All version numbers for these products remain unchanged. The format of the graphic product is not changing.

Change in Default Precipitation VCP: Volume Coverage Pattern (VCP) 21 has always served as the default precipitation mode VCP. Beginning with the release of Build 8, sites will be allowed to change the default precipitation VCP based on agreement by the local Unit Radar Committee (URC). Some sites may not elect to change the default VCP while others may only change seasonally or on a case-by-case basis – all with the goal of maximizing the performance of the WSR-88D to support forecast and warning operations. The Precipitation Detection Function (PDF) will be replaced by the Mode Selection Function (MSF). The MSF will switch the RPG Mode to Clear Air Mode (and consequently the VCP to a Clear Air VCP) after a period of no significant reflectivity (20 minutes, by default). This automatic return to Clear Air Mode is intended to provide better surveillance of clear air echoes and to minimize unnecessary communications bandwidth usage when significant precipitation echoes are no longer present. However, the URC can modify this behavior through an adaptable parameter change. The switch to Clear Air Mode may remain a manual effort if the site so chooses.

Two Products To Be Added To RPCCDS Multicast Stream With Build 8:

1. System Status Log Product. Central collection and multicast broadcast of this new product (ASP, Product 152, Archive III Status Product) begins when Build 8 is installed on RPGs and NWS AWIPS OB6 software is installed. The AWIPS will have a cron making one-time-requests for the product every 8 hours (0, 8, and 16 GMT). This product will also be added to the Satellite Broadcast Network data stream.

2. New Mesocyclone Product. Central collection and multicast broadcast of the new mesocyclone product (MD, Product 141) is planned to begin when Build 8 is installed at all sites (late summer 2006).

Details of the product changes are in the Build 8 Interface Control Document (ICD) for RPG-to-Class 1 Users and the Product Specification ICD. Users can obtain a copy of these documents at: http://www.roc.noaa.gov/ssb/cm/icd_downloads.asp.

Changes in Site Location Information: Updates have been made to the Build 8 RPG adaptation data with respect to the site location/elevation data at 47 sites. The updated information is based on recently completed GPS evaluations of sites. There will probably be few more changes made in conjunction with the release of Build 9.0. If you need a list of affected sites or the new data values in advance of Build 8 being loaded on the RPG, please contact Tim.D.Crum@noaa.gov.

PLANNED CHANGES:

Build 9: Deployment of RPG Build 9 software is scheduled to begin on 9 April 2007. The software will be shipped to sites as a kit which will include a new RPG LINUX-based processor. The format and content of the RPCCDS products should be identical except for the improved performance of some of the products as described below. The Radar Operations Center (ROC) will release information on the product and VCP changes prior to the first beta test deployment (January 2007).

The SZ-2 (Sachidananda – Zrnic) algorithm. This new algorithm will provide a new range unfolding technique to alleviate the effects of the fundamental range-velocity ambiguity that exists with Doppler weather radars. Range aliasing can occur when a returned signal may be associated with one of several pulses transmitted prior to the latest pulse. This algorithm will generate no new products and should result in fewer areas of range aliased data, sometimes referred to as "purple haze." This will provide users a view of more echoes/reflectivity targets (e.g., severe thunderstorms, tornadoes) by correctly placing range aliased targets at the correct range and displayed with correct radial velocity. New VCPs are being developed to add SZ-2 to the system. The VCP numbers will be 211, 212, and 221 and will use the same elevation angles as used in VCPs 11, 12, and 21, respectively. Therefore external systems may need modification to recognize the new VCPs. Implementation of this algorithm in Build 9 is dependent on successful field tests in 2006.

Mesocyclone Detection Algorithm (MDA) Enhancements. This will change the source of mesocyclone data from the legacy Mesocyclone Algorithm to the new MDA for the following products: Composite Reflectivity Combined Attributes Table, Radar Coded Message, and alerting based on output from the MDA. External systems that parse the graphic attributes table of the composite reflectivity product will need a minor software modification to accommodate the new MDA information. This action precedes the likely removal of the legacy Mesocylone Algorithm in Build 10.

Ingesting Environmental Data from AWIPS into the RPG. The RPG uses environmental data which is manually entered (temperature profile information in the Hail Detection Algorithm and wind profile information in the velocity dealiasing algorithm). Transferring environmental data automatically from AWIPS to the RPG will ensure all environmental data in the RPG are updated regularly and accurately without relying on human intervention.

ADDITIONAL INFORMATION:
Changes made to the WSR-88D software are in response to NEXRAD Program approved requirements.

The ROC has a URL (http://www.roc.noaa.gov/ops/ssm.asp) for users to obtain:

(1) A list of sites and which RPG and RDA software build the site is using, and
(2) A list of sites and which volume coverage pattern the site is using, during the last automated hourly ROC call to the RPG.

Warning Decision Training Branch training materials prepared for WSR-88D NEXRAD agency operators can be found in the Build Updates section at: http://www.wdtb.noaa.gov/. The ORDA/RPG Build 8.0 Training can be found at: http://www.wdtb.noaa.gov/buildTraining/Build8/build8deploy.pdf. While many of the changes discussed earlier are not available on the RPCCDS, the training material provides information on new capabilities provided to NEXRAD Agency WSR-88D users.

The NWS has prepared a LINUX version of the WSR-88D RPG software for anyone who wants to use the data. This program is called "The Common Operations and Development Environment" and is located at: http://www.weather.gov/code88d/. Build 8 RPG software is available now.

Send suggestions, comments and questions concerning this summary to: Tim.D.Crum@noaa.gov.